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Provision of private healthcare services: an expansion decision

António Neyra Brandão de Vasconcelos | 1517

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Prof. Diogo de Lucena

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Executive Summary

Hospital da Luz is the leading and reference hospital of Luz Saúde Group, one of three mayor private health players in Portugal. Hospital da Luz, nowadays, has high occupancy rates and is practically full. The study's conclusion of expanding the current Hospital facilities is taken after evaluating if the Hospital's activity allowed by that expansion is appropriate and suitable to the actual and future Portuguese market's circumstances, and also, after evaluating a set of different expansion's possibilities.

Keywords

Healthcare | Portuguese Healthcare Provision | Expansion Decision | Hospital Expansion

Purpose and methodology

This work project was elaborated with the immediate purpose of answering Luz Saúde Group question whether to buy or not the adjacent fire station terrain, as a means to support an expansion of activity. With that aim, analyzing objectively if Hospital da Luz's expansion is suitable and appropriate in the current circumstances is necessary. The decision factors are both external: the market situation, the social and economic situation of Portuguese, the State's role in health; and internal: the exploitation of scale and scope economies and the different alternatives for the Group's expansion.

In order to build an argument it is necessary to scrutinize the referred factors that are at play and understand if they fit in a way to create the conditions to successful and stable benefits throughout time.

Trends in the healthcare market are analyzed, focusing specifically in the Portuguese market. Once we conclude that the national market has some growth possibilities and perspectives, Lisbon's current situation is examined. Finally Luz Saúde Group is described, and Hospital da Luz expansion decision considered.

Healthcare market analysis

Portuguese current healthcare situation

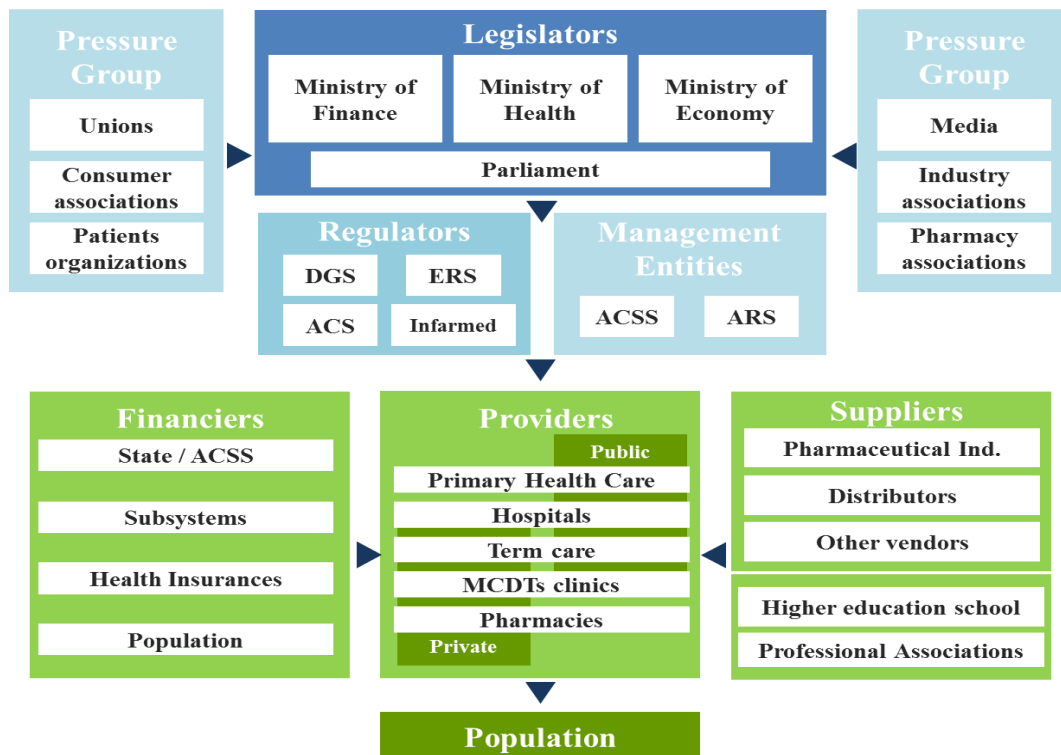
The type of National Health Systems differs from country to country, especially in what refers to the relation of public and private offer. These differences, according to Simões (2009)ⁱ and to WHO (2002)'s reportⁱⁱ were motivated for three main reasons: (i) the cultural, social, political or economic environment (ii) differences in the priority order (iii) different national health service mechanisms and functioning across countries. Assuming the same ideological starting point of having a social state in charge of a social protection to its citizens, there are different ways in which the state interferes in the health national system. In the Beveridigean health model, public entities are in charge of the construction, management and funding, mainly through taxes, of the health institutions, as well as of all the hospital care. Ambulatory service is the only one offered both by public and private entities.ⁱⁱⁱ The United Kingdom is an example of this model. In the Bismarkian model there is a national health social insurance. There are both public and private services and the state's main role is to control and regulate both care provision and insurance norms.^{iv} Germany is an example of this model. In Portugal as in other European countries the strategy was to mixture both models, taking advantage of the incentives obtained from the private competition market but maintaining, as the public agent, an important role in health provision.^{iv}

Therefore, in Portugal we can identify different stakeholders in the health care service and each one of them plays different roles. (*Diagram 1*) The legislators affected by the pressure groups give regulators and management entities the guidelines and norms to supply the health service to the population. These regulators and management

entities are in charge of controlling the actual health service public and private providers that are in charge of serving the citizens and that are at the same time influenced by both by their direct suppliers and funders.^{v, vi}

This system can be represented in the following illustration:

Diagram 1 – “Stakeholder in the Portuguese healthcare system”^v

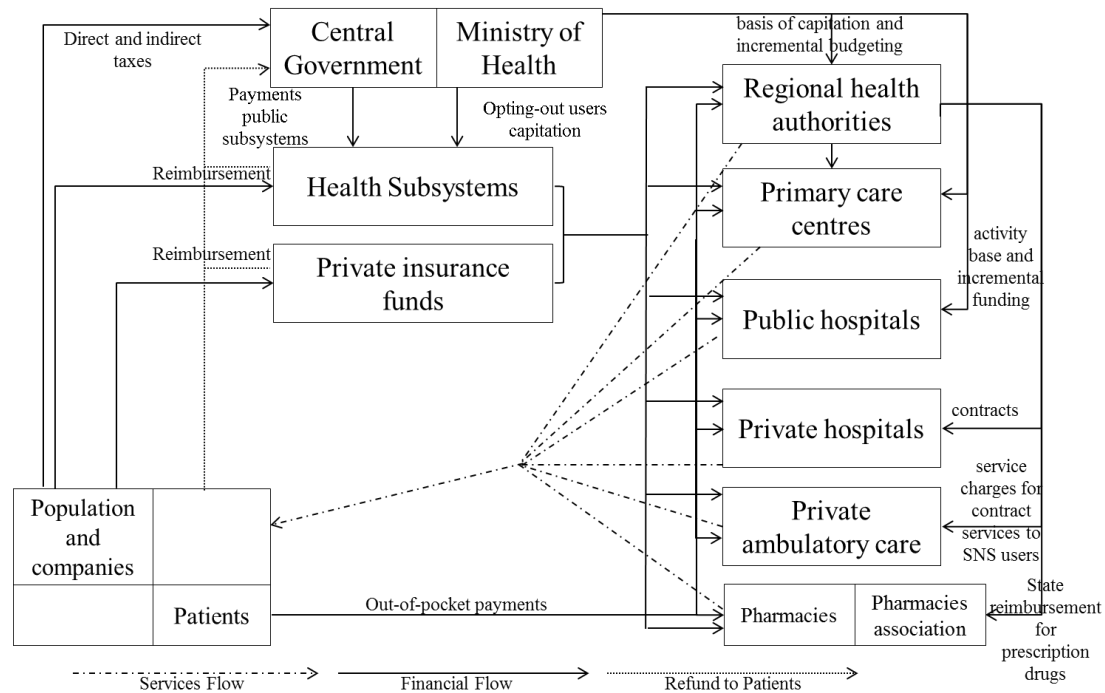


In order to construct the conceptual framework behind the healthcare functioning, a simplified view of the sector financing, of the main players in health provision (both public and private), and of the expected evolution of the segment is given.

Financing

Starting with the financiers of the health systems, in *Diagram 2* a general vision of the health system is given. Citizens and population are central to the analysis once that they are the actual client, the possible future patient and the ultimate source of financing simultaneously.

Diagram 2 - "Health System General Vision" (Oliveira et al, 2005^{in vi})



Citizens are the ultimate source of financing of every healthcare provision they will receive now and in the future both through direct or indirect taxes and through direct contributions to insurance and health subsystems. Central Government, through its Health Ministry, uses that financing to directly support public health entities as public hospitals and ambulatory centers, but it is also used to guarantee and supervise, through Health Regional Authorities, the services offered by private hospitals and private ambulatory centers. Patients only have to pay out-of-pocket in two situations: in public hospitals they must pay directly user fees if they are not included in an exempted group of citizens; and in private entities if they choose to receive private healthcare and are not insurance covered patients^{vi}.

An interesting point is that even that in theory there are no services excluded from the Portuguese *Serviço Nacional de Saúde*, SNS, there are some specific areas that are not commonly offered by the public service. Two examples are dentistry and oral health that are neither offered nor financed by the national service.

Nowadays, health provision assurance is the State's and public institutions' responsibility but the healthcare service provision can be made whether by public services or by private entities under public supervision. The state's role is consensually becoming to be seen not *only* as a service provider but yes as a guarantor of that service.

The Portuguese public health system

The Portuguese National Health Service, SNS (*Serviço Nacional de Saúde*) is nowadays the largest operator in the healthcare market; however it has not always been like that. SNS's evolution can be helpful to understand how public and private health provision perceptions have changed.

Portuguese healthcare evolution can be divided into three main phases. (i) In the first stage there start to appear the first public worries with health issues. In fact, it was not until the last year of the 19th century that there was, for the first time, initiated an organization of the public health services in Portugal. Only half a century later, in middle of the 20th century the first public response to a health issue was developed, in that occasion, to treat epidemiologic diseases. As a conclusion it can be said that during this period, Portuguese's access to health services was very limited. (ii) A second phase can be identified since the State's official intention to guarantee health care to all its citizens through national policies. It can be considered as the first step to the construction of a real National Health Service, SNS, that was implemented in 1976 and then reviewed constitutionally in 1989 as a “universal, general and *tend to be free* NHS”. State had changed the way it faced healthcare and was now the main provider. (iii) A third stage begins in the last years of the 80s when the State starts to be concerned with the weight of health in public finances. Some important

entrepreneurial principles are introduced in the health activity. 1990's "Basis for Health" is the first law to recognize that health is not just a "right but also a joint responsibility of citizens, society and State". The gate for the expansion of private health provision was then opened ^{vii} although there were already some private clinics and institutions (CUF for instance).

Public expenditure in health during the last decades can be a good indicator of how it has been gaining importance in society. Analyzing government's expenditure on health as a percentage of the total government expenditure helps to understand how health issues' importance has been changing over the years. There are some reasons to explain why public expenditure in health has increased. Some Portuguese authors as Novais (2010), Silva (2010), Castilho (2003) ou Simões (2009) try to explain why total expenditure in health have increased every year during the last 30 years by listing the reasons into three different areas: (i) demand (ii) supply and (iii) economic factors. In the demand side, they say it can be explained by an older, with higher life expectancy, cultural evolved, richer and more informed society. In the supply side the reasons would be broader health coverage, developed skills and technologies, better organized healthcare mechanisms. Finally, in what refers to economic factors, reasons are the development of productivity in the Health Sector ("Baumol's cost disease" – See *List of Appendix*, p. 3) or even higher GDPs knowing that health expenditure have positive income elasticity.^{viii} In the last 20 years, and following most of the EU countries, Portugal has increased the importance of public expenditure on health relatively to his total budget. Twenty years ago, in 1995, public-sector expenditure on health as % of total government expenditure was, based on WHO estimates, only 11.24%. However, and as years went by, healthcare gained relevance and its percentage weight on the total budget rose. It rose constantly until 2002 when its

relevance established around 15% of Portuguese government's total expenditure. After the world economic and financial crisis it lost some relevance on total expenditure having registered percentages of 12.48% in 2012. When data is compared to EU members before 2004 that, even having similar numbers in 1995, 12.76%, and having the same tendency to grow in percentage terms, grew to 14.77% in 2000 and to 15.26% in 2004, it is noticed that these countries were able to surpass the Portuguese stagnation since the world crisis and have been able to keep a constant level of around 16% over the last 7 years.^{ix}

The Portuguese private healthcare market

On the private health provision side, it is not enough to analyze the agents that provide health care services and one also needs to analyze the health insurance market as it is the major mechanism of payment and access to the private health institutions. Therefore, it can be stated that competition in a country's private healthcare system has two levels: (i) competition among health insurance plans and (ii) competition among healthcare providers.

The health insurance segment has experienced a relevant growth over the last years in the Portuguese reality, a market where private insurance have a key role in the national health system. When figures from 1990 are compared to the present it is seen that the amount of citizens covered by any type of private health insurance has more than quadruplicated from 0.5 to 2 million. *Chart 3 in appendix*. Both the amount paid by the insurance companies in the last decade, and the insurance sector weight in health total expenditure have grown significantly.^x Summing all varieties of health insurance subsystems, both private and public (1.3 million correspond just to those

covered by the main public insurance, ADSE),^{xi} in total it is expected that around 4.2 million have double coverage in relation to the SNS.

During the 80s, and looking now at the provision side, the private sector was seen as a sector with no future both due to the existence of a recent SNS but also because it was seen as a segment that would complement the public service and depend on its inefficiency. Nowadays, it became clear that the sector is not living off the leftovers of the public institutions and it is totally built, dynamic and with an ambitious vision.

This significant private healthcare market growth is due to some key factors. Two international authors as Y. Tountas et al. (2005), Doyle et al. (2000) indicate these factors as being: (i) an higher quality in private institutions; (ii) important technology investments technology; (iii) the quick growth of private doctors; (iv) the fact that private institutions have also started to make more complicated procedures. (See *List of Appendix*, p. 3)^{viii}

There are three main agents in the Portuguese private health sector (*see List of Appendix, Chart 1*): (i) José de Mello Saúde, (ii) Lusíadas Saúde and (iii) Luz Saúde Group. Jose de Mello Saúde group's involvement in health care services began in 1945 in Portugal by serving the group's industrial workers and familiars. These 70 years of experience make them the oldest private health operator in Portugal. The group counts with 5 different hospital being 2 of them Public-Private Partnerships, PPP. There are two key units: CUF Infante Santo, the group's first and still reputable hospital considered a quality reference in the sector; and Hospital CUF das Descobertas, opened in 2001 and considered as one of the most modern and recognized hospitals in Portugal. José de Mello Saúde counts with 6600 workers and has more than 1400 beds in all its units. Group HPP, created in 1998 and now called

Lusíadas Saúde since the new brand presentation in May 2014, is the third major player in private health care in Portugal. Lusíadas Saúde was bought in 2013, by a Brazilian company, Amil, that belongs to the American UnitedHealth Group adding value to the Portuguese group through the already gain experience of both groups in the sector. It counts with 5 different hospitals, being Hospital de Cascais a PPP. In total the group offers more than 660 beds. Finally, the now called Luz Saúde Group, former Espírito Santo Saúde Group, since its creation in 2000, has created 8 hospitals, one of them in a PPP regime. The group nowadays counts with almost 1200 workers and offers almost 1200 beds. During the realization of this Work Project the group was bought, after several weeks of negotiations, by the Chinese company, Fosun, which had already acquired the Portuguese insurance company Fidelidade. Even that both groups can benefit from small partnerships as specific products offered in GLS units, both Fidelidade and Hospital da Luz representatives^{xii} have make public their intention of offering total freedom of choice to their clients and to insurance companies respectively. The three groups together represent more than 75% of the total 1500 million euros Portuguese private health market value.^{xiii}

Over the years, with the increasing sector's consolidation, competition among private players has intensified. In general they compete in excellence, clinical staff, price, conditions, technology and innovation. Competition is not reserved only to the private main players. In fact, they also compete with small private clinics and ambulatory services, with public services and, in the near future, with EU countries' alternatives¹.

The Portuguese healthcare service: present and future

We start the analysis by looking at a specific physical resource: beds – probably, the most typical method to compare different healthcare offers among different regions.

¹ New norms that will allow EU's citizens to receive health services in other countries that not their home country

The results tell us that in Portugal in 2012 there were 3.38 beds per 1000 inhabitants; the average total number of beds of the last 12 years in Portugal was of 3.51 while the average number in the rest of OCDE 34 countries was 5.19. In what refers to private beds the Portuguese number for the last 12 years is less than 50% of the OCDE average (0.23 and 0.60 beds per 1000 inhabitants, respectively). However this analysis, should take into account the economic level of each country. Therefore an analysis was made putting into relation these values with each country's GDP per capita. Results demonstrate that even so, Portugal is under the OCDE tendency.

Regarding the main technical healthcare provision services, – MCDT² (Computed Tomography, PET exam; and Magnetic Resonance) - numbers are also compared. In Portugal, excluding CT which average number of exams per 1000 Portuguese inhabitants is higher than the last 5 years average for OCDE countries (81.7 and 119.2) , both PET exams and MR have lower ratios (22.3 PET exams close to the 25.2 average; and 0.7 MR exams per 1000 inhabitants, just one third of the 2.1 average for OCDE countries). However, it is important to refer that these numbers, and in contrast with the number of beds, are above the OCDE tendency.

Finally in what refers to the average number of doctors' consultations offered per capita during the last 15 years, one can conclude that in OCDE countries this number stands at 6.63 while in Portugal it is close to 4.5. Once again, if GDP is considered, it can be also concluded that Portugal value is below the tendency. (*See List of Appendix, Graphs 2,3 and 4*)

On the other hand, there are some dynamic impacts that even if they do not strongly affect the market in the present, will have an important influence in the near future.

² “Complementary Means of Diagnosis and Therapy”

To begin with, Portuguese public expenditure in health has been growing in absolute terms at a higher rhythm than the GDP itself and that creates a serious concern about the sustainability of the SNS. Comparing 2000's values to 2014, in constant prices, GDP has grown slightly (something more than 1%^{xiv}) while the current expenditure in health care grew by more than 7%. The public health sector can be expected to continue to suffer strict pressure in what refers to its funding, and that will imply, unless there are some structural reforms, low level of investments in technology and innovation. Portuguese public sector health expenditure relatively to total expenditure in health is low when compared with EU countries (62.64 to 75.87).^{ix} That is to say that the Portuguese private sector expenditure on health, relatively to total expenditure, has more weight in Portugal than in other EU countries. On the private side, this aspect is expected to continue to benefit the main groups, which have broader portfolios of services and that are focused in innovation and excellence, presenting a competitive advantage and a stronger attraction to doctors.^v

Another factor that will, certainly, influence the Portuguese market in the near future, as well as other European countries health markets, deals with the demographic evolution that most developed countries are experiencing. Population is getting older (ageing index 134), the average life expectancy is getting higher (80y.), while the birthrate is one of the lowest in Europe (7.9). (*Appendix, Table 4; List of Appendix, Figure 4 and 5*). An important clarification in this topic is that ageing, from Pedro Pita Barros' perspective, is not "the main cause to an increase on health expenditure increase". In fact, that myth comes from a series of fallacies that Pita Barros tries to organize in three main ideas (i) the great volume of health expenditure comes in the two last years preceding death (ageing just means transferring to a later time that expenditure) (ii) there is technological innovation directed to elderly people, the

increased costs come from these innovations and not from the demographic evolution (iii) there is a confusion between the health and social security expenditure (which in fact has added costs with the population ageing) making people perceive both concepts as equivalent.^{xv}

Chronic diseases also have an important role in what refers to healthcare. Portugal has high levels of chronic diseases directly related with lifestyles. The fact is that the two leading causes of death - cerebrovascular and cardiovascular diseases - affect Portugal more than the majority of European countries. Chronic diseases are expected to represent in the coming years between 60 and 80% of the State's total expenditure on health, even ignoring indirect costs as absence from work (that nowadays represent 43% of total absenteeism) or early retirements.^{xvi} Prevention through an education focused in changing risky habits and in creating awareness is being introduced to society. Nevertheless, society continues to marketing unhealthy products and activities. A recent study, ordered by Gulbenkian Foundation, also alerts to the possibility that "keeping people waiting for attention is costly and may lead to (...) chronic problems" supporting the reasoning that "poor quality health care is not only bad for patients, it is also very expensive, treatments not well done the first time need to be repeated". These two arguments intensify the pressure for a high quality healthcare provision.^{xvii}

In many industries more technological advances translate into lower costs but there is a particularity in what refers to the healthcare services. Although the bet on innovation in health is good in the way that it translates into new treatments and opportunities to patients, it worsens the financial difficulties for it increases costs. An easy example of one of the strands of why this happens is that years ago a 90-years-old was not operated while today, due to the technology innovation that simplifies the operation, she is operated: one more argument impacting SNS future sustainability.^{vi}

To conclude, there is a real SNS's financial unsustainability concern motivated by: (i) the population ageing implying the decline of active workers (ii) the technologic innovation and its costs (iii) and the significant number of chronic diseases in Portugal. It is believed that the referred unsustainability can have as a consequence an increasing privatization of the sector. ^{vi}

One more circumstance, that seems to be a proof of the great increasing demand for private healthcare is the number of health insurance. This sector in Portugal seems to have a free way to progress. Despite the economic environment, it is expected to have a growth higher than 3% a year in the next years. Nowadays, including ADSE, other subsystems and private insurance, the number of people with some kind of health insurance represents more than 40% of Portuguese population.

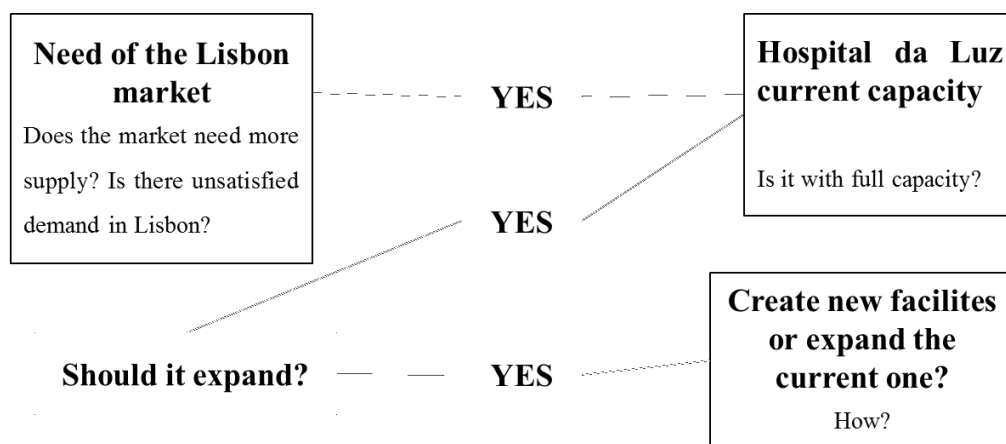
Some authors believe that collaboration between the private and public sector would be a win-win situation. ^{xviii} From Doyle and Bull perspective, in the future neither sector will be able to supply alone the entire necessary healthcare so beginning to form alliances would be good for both. These partnerships can configure win-win situation: the state sees services that he is not able to supply, being offered to its citizens; and the private sector has the opportunity to develop itself. Some partnerships have already been established, namely some PPPs.

Luz Saúde | decision for expansion

The previous analysis addressed the Portuguese healthcare market situation as well as some of the external influence factors and some of the problems and tendencies that seem probable to happen in the following years, setting the basis for a deeper examination in what concerns the expansion or not of a hospital unit in Lisbon.

A priori, precedent results indicate favourable conditions for a potential expansion. Nevertheless, factors are not enough to guarantee that Group Luz Saúde activity should be enlarged by expanding Hospital da Luz in Lisbon. In order to appraise this hypothesis it is important to evaluate a set of aspects that will contribute to the final verdict.

Therefore a model is developed to understand whether the decision of expanding Hospital da Luz is recommendable or not. It is divided into 3 different parts.



- **Need of the Lisbon market** | In the first part of this Work Project the health market was studied generally. Then, the Portuguese market was analyzed as a whole. The key question now is to confirm that there is also unsatisfied demand in Lisbon. According to the results of this analysis, and also based in the examination made to the sector and its estimates for the future, it will be possible to decide if there is a lack of supply in Lisbon.

- **Hospital da Luz current capacity** | If it is concluded that there is a need for more private healthcare services in Lisbon, it is important to evaluate if this services cannot be provided by the current Hospital da Luz infrastructure. That is to say, it is necessary to confirm that there is actually the need to expand physically the Group's current unit.

- **Create a new facility or expand the current one** | If it is validated that there are both a need on the market and a lack of capacity of the current infrastructures, the analysis relies on 2 different alternatives: to expand the current facility, Hospital da Luz, or to build a new facility somewhere in Lisbon. An analysis focusing the pros and cons of each of these alternatives is indispensable to reach a substantiated conclusion.

The Lisbon market

As said before the goal in this chapter is to understand if there is unsatisfied demand in Lisbon that can be fulfilled by increasing the supply and private services.

Besides all the above-mentioned arguments that seem to sustain the idea of the need for more healthcare supply in the Portuguese market there are some additional arguments in favor of an increase of supply in Lisbon area.

In what refers to the Lisbon reality, there are two aspects that can be straightforwardly highlighted. The first one refers to the physical resources: there are 3.9 beds per 1000 inhabitants, a value slightly higher than the Portuguese average, 3.4, but far below the European tendency.^{xix} The second refers to public hospital's occupancy rates facts are clear and indicate that public hospitals are practically full. In Lisbon in the last 3 years, occupancy rates of the most important public hospitals in the capital are around 90%. *(Table 5 in appendix)*

When looking at the dispersion of different hospital units (*see List of Appendix, Figure 6*) it may seem non-sense to expand the activity in Lisbon, where the majority of private units are located. However one should notice two facts: (i) the first deals with Portuguese demography. where population is distributed unequally with most of the population living in the coastline and especially in the Greater Lisbon and Porto

which together represent almost 50% of Portuguese population ^{xiv} (ii) the second argument deals with the size of the Hospital's target market: one unit located in Lisbon obviously serves Lisbon's area, but for some specific clinical areas it can serve all the country, something which is made possible by the small size of Portugal and its developed transport network.

Hospital da Luz current capacity

If in Lisbon there is unsatisfied demand, and there are opportunities to increase the supply of private services a vital question is to understand if H. Luz has free capacity.

Table 6 – Private units and HL occupancy rates comparison, *presented in Consolidated Income Statement 9M2014*

	2013	9M 2014
Consultation offices occupancy rate - private units	47%	49%
Hospital da Luz	51%	53%
Operation room occupancy rate- private units	63%	66%
Hospital da Luz	82%	85%
Internment occupancy rate - top 4 private units	56%	57%
Hospital da Luz	71%	74%

The important message to take out of the analysis to these figures is (i) one the one hand, Hospital da Luz presents higher occupancy rates than private sector average (ii) and that these rates are difficult to increase. (*See List of Appendix, p. 8*) This second point indicates that the current facilities available in Hospital da Luz are not enough to absorb the increasing demand in the Portuguese and in the Lisbon market.

Create a new facility or expand the current one?

In order to evaluate if the best decision is to create a new unit or to expand an existent one a pro-and-cons analysis is made. Some of the *pros* of expanding the current unit are consequently the *cons* of the creation of a new unit and the opposite way around.

Starting with the cons that would indicate a new unit construction as a better solution there are mainly two arguments:

(i) The first danger or risk already mentioned is the geographically dispersed demand. To what extent, when picking a hospital, does the distance from home weights? From this Work Project's perspective, this factor is not a key element for the patient's decision. However, its importance, even that unknown, cannot be ignored.

(ii) The second risk would be to expand more than the real necessity or demand. There is a threat of passing from very high occupancy rate, to a hospital that wastes resources. A creation of a new unit with some scale economies implies a significant enlargement while an expansion in the current unit can be more gradual.

On the other hand, the main factors that support the expansion of the existing infrastructure are (i) the weight Hospital da Luz has gained in people's perspective (ii) the medical corps (ii) the reputation-effect and (iii) the costs differences.

(i) According to Isabel Vaz, executive president of the group, "Luz Saúde name recovers the group's key asset by referring to the biggest investment ever made in healthcare in Portugal"³. Hospital da Luz created in 2002 is the Group's most recent hospital unit and it is a reference to the group as "the holding's brand" and as the biggest private hospital in Portugal. It is also a reference to the private health sector where the Hospital is considered as an asset of the Portuguese private health sector.

(ii) From a clinical perspective, it is better to increase the medical corps rather than creating a new one for a couple of reasons

a. Having a "star-doctor" that teaches other doctors that work with him during the years will transform that "student-doctor" in a "star-doctor" later, something that does not happen without a constant interaction between doctors. Added to this, Hospital da Luz is becoming increasingly a teaching hospital.^{xx} This would be lost if a new unit is constructed, once that the medical corps would be reduced and separated.

³ Isabel Vaz comment in the new logo's presentation, October 15th 2014

b. A hospital works 24/7 as a result of the many emergencies and unexpected patients that may appear. If a new unit is created it is necessary to greatly increase the number of medical staff. This argument, in reality, is common to other areas of the hospital service. From an operational point of view, maintaining one location avoids a duplication of services, workers, supervisors, managers, etc. An important factor if it is considered that salaries and fees represent around 45%^{xx} of the hospital's costs.

(iii) Besides being an important reference, Hospital da Luz has also been able to construct, since its creation, a distinctive reputation. Reputation is an important factor in many different sector and markets: healthcare is not an exception. As to any other product or service, having a favorable experience will mean a comeback or even a brand loyalty. If the hospital is able to have a service quality coherent with its reputation it is a good momentum that has to be maintained. A similar and related argument is the “habituation-factor”, where people choose the hospital based in where they are used to go; if a baby is born in a specific hospital, probably he will go to its pediatrician there, and when he is 12 and his legs is broken he will consult a doctor there, and so on. Based on this argument the fact that last year Hospital da Luz was the second largest hospital maternity in Portugal, after MAC, transforming it in the largest private maternity, helps a lot. In Pedro Líbano Monteiro opinion's, “healthcare is probably one of the most irrational sectors in what decision-making is referred. Clients decide quickly their decision based in different influences since someone's opinion, even if it is not well-versed information, or based in each self-opinion” and that is why having a reference hospital in which they believe is so important.

(iv) Another argument is that medicine is suffering an increasing specialization meaning that similar diseases that were treated likewise by the same doctor are nowadays starting to be treated with different techniques and professionals. This

argument implies that a small unit is no longer “useful”, doctors have to interact constantly. Even being obvious that doctors can interact virtually or periodically without the necessity of being in the same physical place, it is also obvious which one is the best solution for efficiency reasons. Apart from that there are also some studies, related with scope economies applied to the healthcare provision and hospitals in particular, that point that the joint production cost of two different services is less than the cost of separate production. An example is a Pita Barros and Gonçalves (2009)^{xxi} study for the Portuguese reality that found that there exist scope economies in some MCDTs. Hospital da Luz currently offers most specialties, transplants (legal restriction), burn unit and pediatric diseases (sample very low that makes sense to have specialized unit in a national or regional level) being the exception.

(v) There is another interesting point which is related to the optimal number of beds a hospital should have. This debate is one of the most extensive discussions in health economics. It seems obvious, even from a strict economic point of view, that there is an efficient number of beds in a hospital under which the hospital has an underused capacity, or above which the hospital starts to become inefficient (even if in the short-run seems potentially attractive it will entail diseconomies of scale in the long-run).^{xxii} The optimal number is not consensual among studies, some point out a number of 175 beds for big hospitals in Australia for instance.^{xxiii} However, international studies tend to indicate an optimal number between 150 and 250 to achieve economies of scale.^{xxiv} A Portuguese study, based on Portuguese reality, indicates a number of 274 for the 85% recommendable occupancy rate.^{xxii} This aspect must have a special analysis in the decision of expansion. Once that Hospital da Luz current number of beds is 206 there is still a certain margin of possible growth without straying efficiency.

Conclusion

Aiming to try to answer Group Luz Saúde question whether or not to buy the fire station land adjacent to Hospital da Luz, in this Work Project it was developed a set of consecutive steps. The first step had the goal to understand the healthcare market situation as a whole. The subsequent analysis was then to perceive how was the Portuguese market and how would it develop, but also if there was or would be, indeed, room for more supply in the sector. The following investigation had the goal of appreciating if in Lisbon the same conditions were taking place and if there was unsatisfied demand. Alongside, studying current Hospital da Luz production and capacity was the way to certificate that current facilities were not enough to absorb the unsatisfied demand in the market. Finally, the last step was to evaluate the two possible types of expansion to the group: whether through an infrastructure expansion of the current Hospital da Luz or through the construction of new facilities somewhere else in the capital city. The conclusion was that there is unsatisfied demand both in the Portuguese market as in Lisbon, where supply, including Hospital da Luz, seems to be in maximum levels.

The findings and conclusions of this Work Project result from the analysis made to the market and group's situation and it was not intended to be a pure analytical and financial calculation of the profitability that an expansion in Hospital da Luz would mean.

Although, the decision over this matter seems to have been taken with the purchase of the referred land on December 1st 2014, it must be mentioned that this decision had not been taken in the beginning of this study.

Appendix

Figures, graphics and tables

Chart 3 – Health Insurance Covered People Evolution ^x

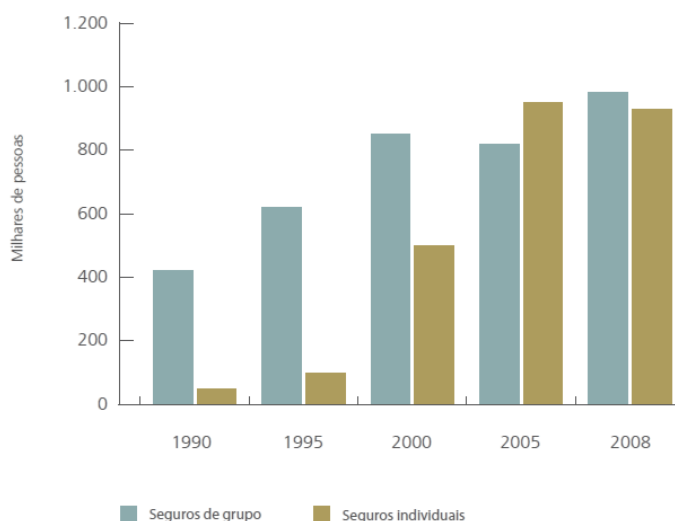


Table 4 - Population Ageing Indicators, in INE and Pordata

Ageing Indicators	1962	1962	1963	1964 (...)	2009	2010	2011	2012	2013
Ageing Index	27,5	27,6	27,8	27,9	117,8	121,6	125,8	129,4	133,5
Total Dependency Ratio	59,0	59,0	59,0	58,9	50,3	50,8	51,2	51,7	52,2
Young Dependency Ratio	46,3	46,3	46,1	46,0	23,1	22,9	22,7	22,5	22,4
Elderly Dependency Ratio	12,7	12,8	12,8	12,8	27,2	27,9	28,5	29,1	29,9
Longevity Index	33,6	33,6	33,7	33,7	46,9	47,6	48,3	48,7	48,9
Birth Rate	24,4	24,5	23,5	24,0	9,4	9,6	9,2	8,5	7,9
Life Expectancy	79,3	79,6	79,8	80,0	80,0

Age Group Percentage in Lisbon	2009	2010	2011
0-14	15,8	15,7	15,8
14-65	66,3	65,8	65,3
>65	17,9	18,5	18,9

Table 5 - Occupancy Rates in Lisbon Hospitals, in (ACSS - Adm. Central Sistema de Saúde)

Occupancy Rates, Lisbon Area	Jan '12	Jun '12	Jan '13	Jun '13	Jan '14	Jun '14
"Centro Hospitalar de Lisboa Central"	86%	84%	89%	87%	86%	94%
"Centro Hospitalar de Lisboa occidental"	85%	84%	88%	82%	85%	81%
"Centro Hospitalar de Lisboa norte"	94%	90%	91%	87%	87%	84%
"Hospital Fernando da Fonseca"	95%	89%	102%	93%	103%	95%
"IPO"	83%	80%	79%	82%	87%	79%
Lisbon and Tejo Valley Total	84%	83%	91%	87%	106%	89%
National Total	87%	86%	91%	85%	94%	87%

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